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The main feature of this issue of the *Gazette* is my own article on Dionysius Lardner, a popular scientific lecturer in the United States in the 1840s. Lardner's career has been discussed by other scholars, especially his role as a popularizer of science in Britain through his voluminous writing and publishing efforts. He was the editor of the 133-volume *Cabinet Cyclopedia*, a series of affordable books on science, history, and biography for which Lardner recruited some of the leading scientific and literary writers of his time. Lardner himself contributed volumes on mathematics and physical sciences, and he wrote other books on topics ranging from astronomy to the steam engine and the economy of railroads. He also began a career in Britain as a popular lecturer, which carried over to his American lecture tour in the 1840s. It is this tour that is the focus of this issue.

Previous scholars have discussed the American tour, mostly in the context of its cultural significance, but there has been little attention paid to the visual aspects of his lectures. Lardner was something of a multi-media science showman, not only making extensive use of the magic lantern, but also the oxy-hydrogen microscope, moving panoramas, working models, etc. He pioneered the use of limelight illumination in the United States and even included demonstrations of how limelight, or the Drummond light, worked, dazzling audiences by illuminating whole theaters with the brightest artificial lights any of the audience members had ever seen.

One of Lardner's attractions at some of his later lectures was an enormous working model of the solar system known as Russell's Planetarium, built by a self educated cabinet maker in rural Ohio. This was an attraction in its own right, and two different models had been exhibited by various people before Lardner. A second shorter article traces the history of this device, a sort of extended footnote to the Lardner article.

The final contribution in this issue is a review by Dick Balzer of a new book by Mike Smith on figurines of itinerant show people with peepshows and magic lanterns. This book will no doubt make a wonderful addition to any magic lantern enthusiast's library.

As always, I am looking for more contributions to the *Gazette* from researchers in North America and anywhere else in the world. Last year we had a series of contributions from young European scholars, but that pipeline has temporarily dried up, and recent submissions have been scarce. Please consider submitting some of your research to the *Gazette*.

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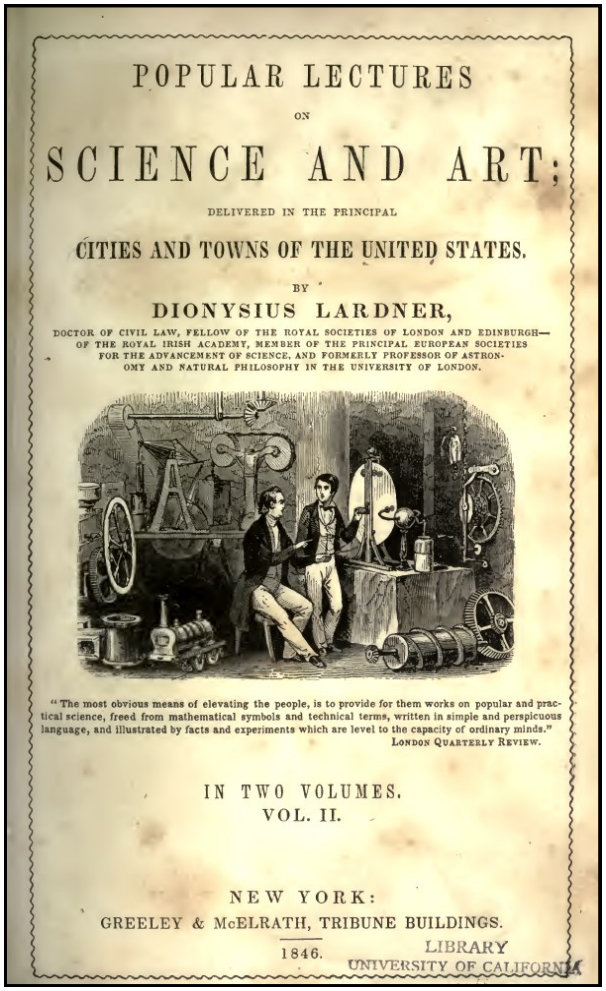
POPULAR LECTURES
ON
SCIENCE AND ART;
DELIVERED IN THE PRINCIPAL
CITIES AND TOWNS OF THE UNITED STATES.
BY
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"The most obvious means of elevating the people, is to provide for them works on popular and practical science, freed from mathematical symbols and technical terms, written in simple and perspicuous language, and illustrated by facts and experiments which are level to the capacity of ordinary minds."
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VOL. II.
NEW YORK:
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1846.
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Dionysius Lardner: Popular Science Showman of the 1840s

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Many historians consider the 1840s to be a pivotal period in the development of American science, a decade in which science became increasingly professionalized.[1] It also was a period of increasing public interest in science, including public lectures on scientific subjects. Some of these lectures were delivered to the educated elite through institutions such as the Lowell Institute in Boston, where Yale's Benjamin Silliman lectured on chemistry and Harvard's Asa Gray lectured on botany. The Lowell Institute also attracted distinguished European lecturers, including British geologist Charles Lyell and Swiss naturalist Louis Agassiz.[2] Lyell's Lowell Institute lectures were part of two tours of the United States undertaken in the 1840s, when he traveled across the country studying the local geology and lecturing in major cities along the way.[3] Agassiz came to the United States in 1846 to lecture at the Lowell Institute and remained for the rest of his career as a professor at Harvard, becoming America's leading naturalist and one of its most important public faces of professional science.[4]

The 1840s also saw heightened activity by amateur science lecturers, who often targeted less educated audiences. Many of these were clergymen, largely self-taught in science, who sometimes lectured in their own churches or traveled to other towns and cities, supplementing their meager incomes with popular science lectures. By far the most common topic for such lectures was astronomy, considered at the time to be the "sublime science" that provided dramatic evidence for the wisdom of the Creator. Astronomy also is inherently a visual science that could be easily illustrated by painted diagrams or magic lantern slides. Many of the clergymen/astronomy lecturers used sets of astronomy slides, including mechanical slides and dissolving views, which could be readily imported from Carpenter and Westley in London, along with Carpenter and Westley's Improved Phantasmagoria Lantern.[5]

In addition to clergymen/lecturers, there were itinerant popular science lecturers who made a living giving lectures to audiences in cities, small towns, and rural areas. The activities of most of these itinerant lecturers are not well documented. Most left few traces in contemporary newspapers, relying on handbills and word of mouth advertising after arriving in a town.

One example is Charles Came (1806-1881), an unschooled cabinet maker and gravestone carver from upstate New York who taught himself enough science to begin lecturing on astronomy, electricity, and other subjects in the 1840s. He largely avoided well-educated audiences in major cities, traveling among smaller cities and rural towns in upstate New York, where audiences had few opportunities to learn about scientific subjects.[6] Over his years of lecturing, Came made or purchased a wide range of scientific apparatus, including instruments to demonstrate properties of electricity, a type of scientific demonstration that had been popular in America since the Colonial Era of Benjamin Franklin.[7]

Came's lectures on astronomy were illustrated by an orrery, a mechanical model of the solar system commonly employed by itinerant lecturers. He made extensive use of magic lantern slides, including illustrations of the planets and mechanical slides illustrating the movements of the planets and their moons. He also used magic lantern slides to illustrate lectures on non-scientific subjects such as "Sacred and Ancient History" and "Beautiful, Moral and Instructive Illustrations for the Children." His collection of instruments included five magic lanterns, three of which were made by New York instrument makers Benjamin Pike & Sons. These included a side-by-side pair of lanterns fitted out to show dissolving views. More a showman than a serious scientific lecturer, Came also provided music for his shows with two different models of mechanical organs.[8]

Dionysius Lardner Comes to America

The most successful itinerant science lecturer of the 1840s was neither a trained scientist nor an American. He was Dionysius Lardner (1793-1859) (Fig. 1), who was born in Dublin, but spent most of his early career in England. He graduated from Trinity College, Dublin, in 1817 and took holy orders as an Anglican priest, but never served in a parish church. Despite having little formal education in science, Lardner was appointed Professor of Natural Philosophy and Astronomy at University College London in 1827, largely due to the patronage of Lord Henry Brougham, a powerful politician

Fig. 1. Dionysius Lardner.

and patron of both the university and of science. Lardner taught astronomy and other science courses at the university until 1831. He made few lasting contributions to science, but built a reputation as a leading popularizer of science, both through the printed word and popular lecturing. In addition to his own writings, including a widely-read book on *The Steam Engine*, Lardner edited the highly successful *Cabinet Cyclopedia*, starting in 1829. This project was not an encyclopedia in the modern sense of the word, but a series of separate books, produced in small-format, affordable editions. Lardner succeeded in recruiting some top scientific talent to contribute to the series, including Sir John Herschel and Sir David Brewster, as well as literary figures such as Sir Walter Scott and Mary Shelley, who wrote volumes on historical topics. Lardner himself wrote volumes on physical sciences and mathematics.[9]

In the 1830s, Lardner cultivated an image as a major public figure in British science mainly through his popular lectures. These were delivered in prestigious venues such as the Royal Institution and the London Mechanics' Institution, part of what has been called the "London lecturing empire."[10] He also lectured in various provincial Mechanics' Institutes and Literary and Philosophical Societies, often drawing large middle class and working class audiences. Lardner's lectures emphasized the wonders of scientific discoveries, as well as practical applications of scientific knowledge to technology. He often lectured on the practical applications of the steam engine, particularly steam railways, illustrating his lectures with diagrams and working models of steam engines.

Lardner's lectures covered a broad swath of scientific subjects, but the content of each lecture was necessarily somewhat superficial because of the limited scientific literacy of his audiences. This brought criticism from some professional scientists, and he was mocked by some literary figures. William Makepeace Thackeray caricatured him as Dionysius Diddle, Docthor Dioclesian Larner, and Dr. Athanasius Lardner, the last being a reference to the 17th Century polymath Athanasius Kircher, the first person to publish illustrations of the magic lantern. Charles Dickens called him "the prince of humbugs," a term more often associated with American showman P. T. Barnum.[11]

In addition to being well known, if not completely respected, in scientific circles, Lardner was a familiar figure in fashionable London society, often hanging out with people from the theatrical world. Apparently he paid particular attention the ladies. In 1820, he began an affair with a married woman named Anne Boursiquot, a liaison that produced a son who became the famous actor Dion Boucicault (a modification of his given name, Dionysius Lardner Boursiquot).

However, it was another relationship with a married woman that eventually ruined his reputation and led him to his lecturing career in the United States. In 1840, he ran off to Paris with another man's wife, a woman named Mary Heaviside. The aggrieved husband, a Captain of Dragoons, tracked down the couple in Paris and administered a beating to Lardner, but failed to reclaim his wife. His reputation as a public figure in tatters, Lardner could not return to Britain, but moved to the United States with Mary Heaviside to restart his career.[12]

The Beginning of Lardner's American Tour

Lardner and Mrs. Heaviside arrived in New York in September 1840. After unsuccessful attempts to make productive contacts with American scientists or find work as a journalist, they moved for a time to Philadelphia for an equally unsuccessful search for employment. Finally Lardner announced his intention to resume his popular lecturing career, starting in New York in November 1841. This announcement was not greeted with universal approval. Some newspapers took a dim view of his moral character. The *Telegraph* of Gloucester, Massachusetts, wrote: "It should be 'kept before the people' that this Lardner is the same individual who, a year or two since, while in

England, destroyed the peace of a happy family, by seducing and eloping with the wife of a very respectable gentleman, named Heavyside. . . . And now the villain, instead of being scoured from all decent society, is invited to deliver a course of lectures in New York!" The paper's outrage was intensified by the results of his first lecture: "We learn from the N. Y. Express that Lardner's first lecture was attended by a crowded audience, the elite of the city, the greater portion of whom *were ladies*! What a moral age we live in!"[13]

Having attracted large crowds in New York in 1841, Lardner announced his intention to lecture in Boston in January 1842, at which point some of the more puritanical New England newspapers renewed their objections. The *Salem Register* complained that "Dr. Lardner, who ran away with another man's wife, proposes to deliver a course of scientific lectures in Boston! Shade of the puritans! Can the descendents of the Pilgrims be gulled into supporting such a man in his iniquities?"[14] The Boston abolitionist paper *The Liberator* was incredulous when large crowds showed up for Lardner's Boston lectures, including "no less than four hundred 'ladies.'" "We do not see how any person can claim to be pure-minded, who attends his lectures or gives him any countenance."[15]

Nevertheless, the large crowds attracted to Lardner's lectures soon overcame any moral reservations about his character. The New York correspondent for the Washington *Madisonian* reported that "Dr. Lardner's lectures continue to be interesting and instructive. Aside from the slight moral obliquity attached to the man, he is certainly better worth listening to than any lecturer I have ever heard."[16] In fact, Lardner's American lecture tour, which lasted until 1844, was the most popular and lucrative enterprise of its kind the country had ever seen. Eventually it circumscribed a great circle around the most settled parts of the country, beginning in New York and moving on to northeastern cities such as Boston and Philadelphia; then southward to Baltimore, Washington, Alexandria and Richmond (VA); on to Charleston (SC), Mobile (AL), and New Orleans; northward to Jackson and Vicksburg (MS) and St. Louis; eastward to Cincinnati and Pittsburgh; and finally back to cities in the east. Lardner actually completed part of the circuit twice, revisiting cities including New York, Boston, Philadelphia, Baltimore, Washington, and Charleston in 1844. He attracted large crowds wherever he went, and newspapers covered his lectures extensively, often printing multi-column or even full-page transcripts of his remarks, along with descriptions of his visual aids. Sometimes lectures given in New York were covered in detail by papers as far away as New Orleans, no doubt copied from sources such as the weekly edition of Horace Greeley's *New York Tribune*, which had a national circulation.[17]

When Greeley arranged to have Lardner's American lectures published as a book, it appeared without illustrations. Although it sold well, the unillustrated volumes made for somewhat dry reading. The truth is that much of the appeal of Lardner's lectures came from his showmanship, developed in England and no doubt enhanced by his contacts with the theatrical world. Lardner was something of a multi-media showman, using a variety of visual aids, including magic lantern slides. Previous scholars have paid scant attention to this aspect of his lectures, but a survey of contemporary newspaper accounts yields a considerable amount of information on the visual aspects of his lectures.[18] Interpreting this information is hampered by the wide range of overlapping terms used to describe his visual aids: dissolving views, transparent paintings, transparent diagrams, dioramas, dioramic views, dioramic pictures, moving dioramas, panoramas, etc. As we shall see, many of these terms actually refer to magic lantern slides.[19]

Lardner's lectures were long, sometimes running two hours or more. Initially he devoted each lecture to a single subject, particularly astronomy. In New York's Clinton Hall (Fig. 2), he talked about comets and the possibility that planets other than the earth might be inhabited. A long, detailed summary of his lecture on

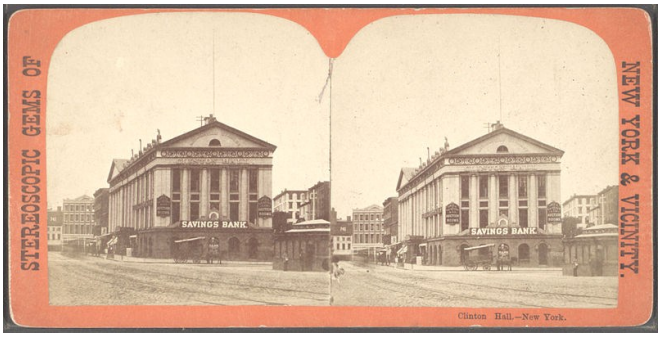


Fig. 2. Stereoview of Clinton Hall, New York, Lardner's first American lecture venue.

New York Public Library.

planets in the New York *Weekly Herald* stated without further explanation that "Several large and beautiful transparent diagrams, illustrative of the solar and planetary systems [Fig. 3], were exhibited by the Doctor." Apparently Lardner quickly realized that speaking for two straight hours was hard on his audience and on him, and the same article in the *Weekly Herald* reported that "The Doctor then proceeded to state that hereafter he should divide his lecture in two parts of three quarters of an hour, with an interval of five or six minutes between to refresh both the audience and himself."

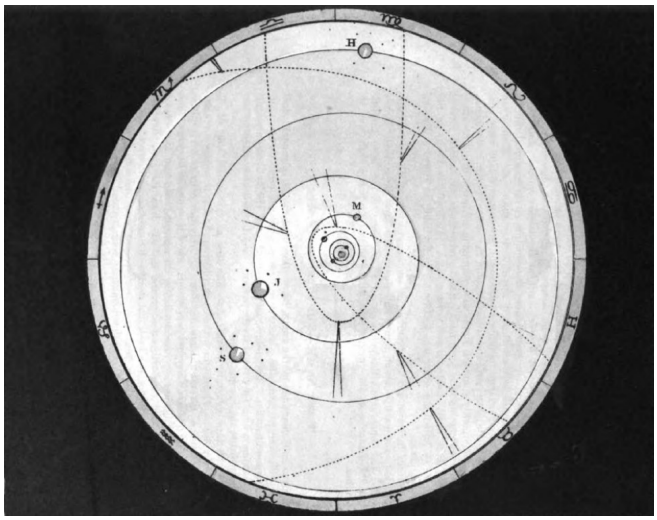


Fig. 3. Lithographed diagram of the planetary system, showing the orbits of the planets and their moons and several major comets. The planet labelled "H" is Herschel (Uranus), the outermost planet known in the 1840s. This illustration and others from the same book are used to represent the general style of illustrations likely used in Lardner's lectures. From: Charles F. Blunt. 1849. *The Beauty of the Heavens*, 4th ed. (David Bogue, London) (originally published in 1840).

Lardner also decided that the wonders of science deserved "more extensive and splendid illustrations." These included "a grand diorama, consisting of between 2000 and 3000 square feet of canvass, exhibiting a view of the heavens" (more on this device later). He also arranged to move his lectures to a larger venue, the theater at Niblo's Garden (Fig. 4).[20]

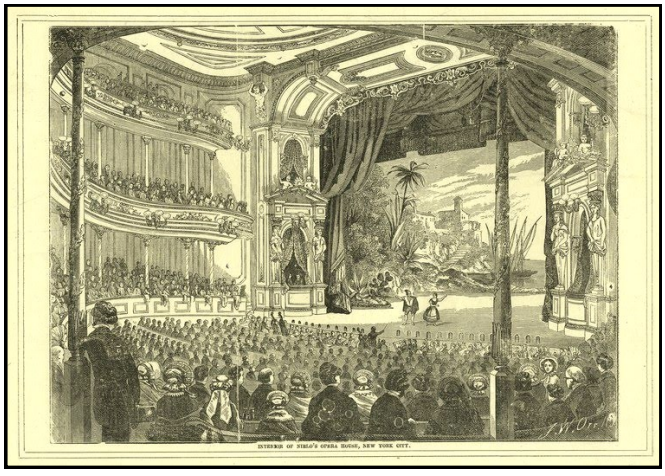


Fig. 4. Interior of the theater at Niblo's Garden in New York, the second venue for Lardner's lectures.

New York Public Library

Lardner soon made additional changes to the contents of his lectures and his visual aids. In December 1841, he delivered his first lecture on the steam engine at Niblo's, where he displayed not only "diagrams" (probably projected), but also a "didactic model of the Steam Engine."[21] Later in December, Lardner gave the first of what would become a common form of his lectures, a two-part lecture on unrelated subjects, one on the history of discoveries in electricity, followed by a lecture on the sun. The *Weekly Herald* provided a detailed summary of the first, but in neither case were the visual aids described.[22]

When Lardner moved to Boston's Tremont Theatre in January 1842, he switched to a three-part lecture format that he used for much of his tour. The *Boston Evening Transcript* for January 15 announced a lecture consisting of the solar system, the steam engine, and the sun and comets. The astronomical parts were to be illustrated with "large transparent representations" of the planets (Fig. 5), the sun, and various comets, while the second part would include working models of steam engines.[23] A second lecture at the Tremont included the steam engine models again and "a part of the telescopic diorama showing Halley's comet."[24] The "Great Telescopic Diorama of the Heavens" made another appearance at a lecture at Boston's Melodeon later in the month.[25]

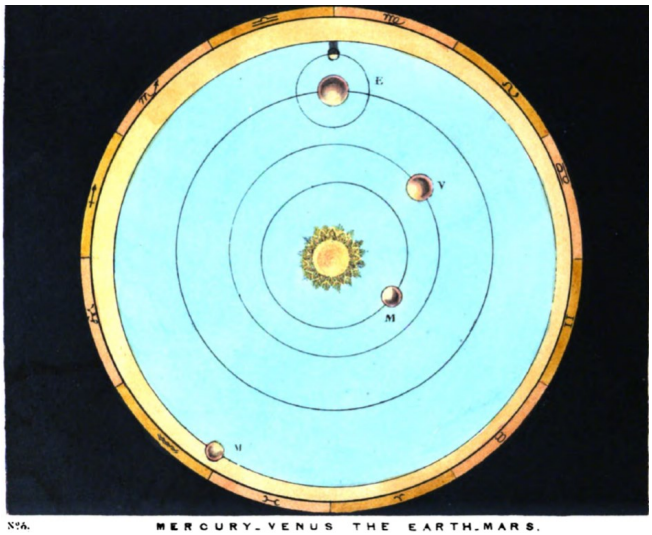


Fig. 5. Hand-colored lithographed diagram of the orbits of the four inner planets around the sun. The moon's orbit around the earth is shown at the top. From: Blunt (1849) *Beauty of the Heavens.*

Lardner delivered similar sets of lectures with similar illustrations when he moved back to New York in February and to Philadelphia in March, often with two parts of the lectures on astronomy and the third on a different topic, such as the steam engine or "the eye and light."[26] The newspapers continued to provide detailed descriptions and transcripts of the lectures. One article in a Philadelphia paper helps to clarify the nature of the Great Telescopic Diorama. It appears to have been a type of moving panorama, but one in which the picture moved vertically rather than horizontally:

> He then proceeded to show a magnificent diorama, or moving diagram of the heavens, as seen through a telescope on the equator. This diagram was painted on three thousand square feet of canvass, and besides exhibiting all the principal planets and comets in their natural aspects, showed the double, binary, and colored stars, the stellar clusters, and nebulae, within forty degrees on each side of the equator. The effect of this diorama, moving up slowly from the stage, to represent the motion of the heavens from east to west, was truly enchanting, and cannot be realized but by a view of the beautiful picture itself. The lecturer only paused to name the different planets and bodies as they rose in succession above the artificial horizon. . . .[27]

A later article in the same paper described this device as a "splendid panoramic view of the heavens."[28] In April 1842, a Washington paper described the same device as a "Transparent Telescopic Diorama of the Firmament," repeating the fact that it comprised "*three thousand square feet of canvass*."[29] This clearly indicates that this movable view of the heavens was lit from behind, in the style of a diorama. As we shall see shortly, the source of illumination was almost certainly limelight.

Lardner spent the last week of March and the month of April 1842 lecturing in the National Theater in Washington, the Lyceum in Alexandria, Virginia (Fig. 6), and a Universalist church in Baltimore (he apologized to anyone whose religious sensibilities were offended by the use of a church, but it was the only venue large enough to accommodate his spectacular illustrations). The topics were much the same as previous lectures, heavy on astronomy, with side excursions into topics such as "Popular Fallacies," "The Aurora Borealis," and "Steam Navies of the United States and Great Britain." Illustrations were described by terms such as "telescopic representation of Mars," "telescopic transparency representing Jupiter and his satellites," and "dioramic representations of the aurora borealis."[30]

Fig. 6. The Lyceum in Alexandria, Virginia, where Lardner lectured in April 1842 and in January 1844. http://www.cityprofile.com/virginia/photos/5091-alexandria-the_lyceum1.html

Lardner and the Limelight Magic Lantern

Up to this point, newspapers had not mentioned the apparatus used to exhibit Lardner's transparencies, possibly because he was using rear-screen projection, with the projector hidden from the audience. The secret was revealed in a Baltimore lecture on April 23. In addition to the usual three-part lecture (The Moon, The Aurora Borealis, The Planets), Lardner added a fourth part, a demonstration of The Magic Lantern and Phantasmagoria, with an explanation of its optical principles and the effects produced by it. This included a demonstration of the principles of perspective; astronomical appearances, such as lunar and solar eclipses; a phantasmagoria exhibition; and "goblin figures, with motions of the eyes and limbs."[31]

The following December, Lardner lectured in Charleston, South Carolina, and the local newspaper gave a detailed description of his use of the magic lantern, showing that terms like "transparencies" and "dioramic representations" referred to lantern slides, a term not in use in the 1840s. The description is worth quoting in detail:

> Dr. Lardner, the celebrated lecturer on subjects of Natural Philosophy, History and Biography, who arrived in this city a few days since, has engaged the Hibernian Hall [Fig. 7] . . . and is making extensive and expensive preparations for the delivery of his lectures and the exhibition of his costly and beautiful transparencies. His lectures will be chiefly on the subjects of astronomy and optics; and with the aid of his brilliant Drummond light, magnifying

Fig. 7. Hibernian Hall in Charleston, South Carolina, where Lardner lectured in December 1842 and in April and May 1844.

> lenses, phantasmagoria and illustrative transparencies, he will render them as attractive to the eye as they will be instructive to the mind. There is much the theatrical or spectacular exhibition in these performances of Dr. Lardner. . . . His first lecture will unfold the wonders of the Moon, illustrated by various telescopic plates, rendered transparent by oxy-hydrogen light; and conclude with an exhibition and explanation of the recent improvements in the art of illuminating towns and buildings, without lamp, candle or ordinary gas light, during which the great saloon will be illuminated by the Drummond light—the most brilliant light known to modern art or science, (except the galvanic light). . . . The second lecture will disclose the mysteries of the Earth, and its succession of seasons, exemplified by transparencies and illustrative drawings; and will conclude with various experiments with the megascope or magic lantern—illustrating the phenomena of phantasmagoria and moving pictures by means of various views, portraits and other figures. The third lecture will unveil the secrets of the atmosphere, the glories of the Sun, illustrated by transparencies, explanatory of eclipses and other solar and celestial phenomena and conclude with numerous optical recreations with the megascope.
>
> We had the pleasure . . . of meeting Dr. Lardner, at the Hibernian Hall, on Saturday evening last, and of witnessing several of his experiments and transparencies. . . . He commenced by exhibiting an elegant transparency, representing the battle of Jena, in which the geographical accompaniments of the scene, and all the military arrangements of that memorable conflict were faithfully and strikingly delineated. This transparency belongs to the historical department. The next transparency was in the biographical department, representing the venerated lineaments of the immortal father of our country, magnified, by oxy-hydrogen light, from an exquisite miniature of four inches into a bust of six feet, without impairing the general fidelity of portraiture or even minute accuracy of outline. Two transparencies then followed, one of the moon and the other of the earth, belonging to the astronomical department. [A long description of the operation of the Drummond light follows].
>
> Dr. Lardner was assisted, and will continue to be assisted, throughout his course, in his interesting experiment, by Mr. Robert Grant, who is associated with him in the practical and yet scientific capacity of demonstrator. Mr. Grant, we learn, is a man of science, distinguished for successful experiments and important improvements in rail-way engineering, and in gas lighting, and for his extensive and varied knowledge and experience in other branches of physics. He does not act as a mere assistant to Dr. L., but is regarded and esteemed by him as a fellow laborer in the field of science.[32]

Two days later, the paper described Lardner's actual first lecture:

> The moon—the inhospitable moon—was his theme; and he proved by reasoning and diagrammatic illustration, that it was without atmosphere or water, an arid aggregation of volcanic mountains—the probable source of meteoric stones—and that, unlike the planets, it was uninhabitable by organized beings. . . . [The lecture] beautifully illustrated by moving transparencies, the formation of the tides by both the solar and lunar orbs. The transparencies were exceedingly attractive, and were magnified by means of lenses of great power and the Drummond light, from miniatures exquisitely painted on glass by a skilled and ingenious London artist. The exhibition closed with an explanation of the Drummond Light, and a display of its luster and its beauties; and the mechanical part was admirably conducted by Mr. Grant, Dr. L.'s associate and demonstrator.[33]

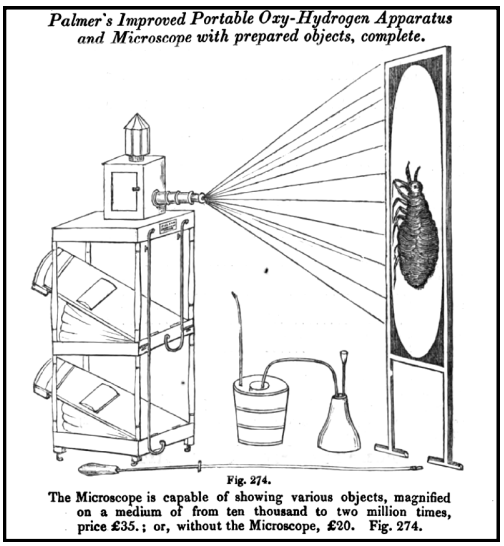
A few days later, the paper pronounced Lardner's third lecture to be the best yet:

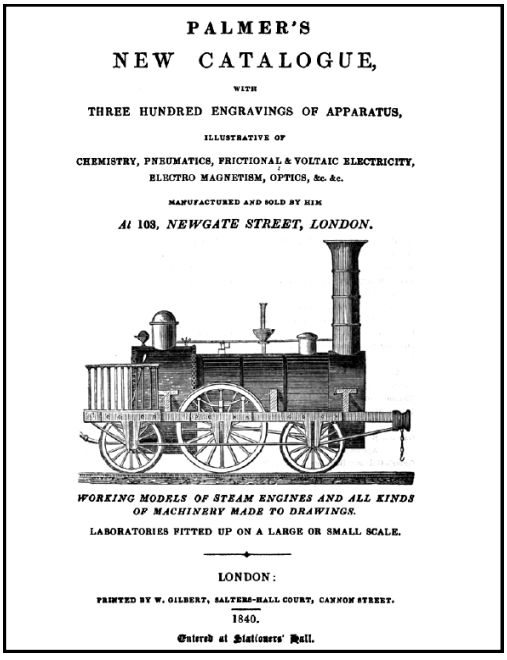
> We were glad to notice a general improvement in the whole matter and manner of the entertainment—no intervals of darkness were permitted to shroud the saloon. The apparatus used for the exhibition of the portraits, flowers, landscapes, diagrams, and illustrative transparencies, worked well, and elicited marks of approval and pleasure, and the learned gentleman's own style of delivery was more animated, ambitious and pleasing. . . . These entertainments, for they can scarcely be called lectures inasmuch as he neither writes nor reads them, will be continued this evening.[34]

In addition to lectures for general audiences, Lardner provided special programs for the children of Charleston. An ad for his lectures on December 21, 1842 announced that Juvenile Afternoon Entertainments would be provided each day at 4:00:

> On Thursday, and each succeeding day during the week, from 4 to 5 o'clock, Mr. Grant will exhibit a variety of views and other amusing objects, with the two splendid Megascopes provided for Dr. Lardner's Lectures. He will also show various interesting and instructive objects, with the Oxy-Hydrogen Microscope. Dr. Lardner will occasionally give familiar explanations of Astronomical and other drawings. These afternoon Entertainments and Lectures will be expressly adapted for the instruction and amusement of young persons.[35]

These descriptions of Lardner's Charleston lectures provide the most detailed account of his methods of illustration of any newspaper articles in his entire American tour. Several conclusions can be drawn from these accounts. It is clear that Lardner's "transparencies" were lantern slides, painted on glass by artists in London and magnified on a screen with a magic lantern. The mode of illumination was limelight (also known as a Drummond light, oxy-hydrogen light, or calcium light). In fact, Lardner may have been one of the first persons to use limelight lanterns in the United States. The first use of limelight in magic lanterns in Britain did not occur until around 1838.[36] A search of American newspapers for all possible names for limelight failed to uncover any examples of use with the magic lantern before Lardner's lectures. Lardner also was using an oxy-hydrogen microscope to project microscope slides. This instrument had been used before in the United States. For example, an 1835 ad announced an exhibition of Dixon and Reed's oxy-hydrogen microscope in Lowell, Massachusetts.[37] This instrument would not have been like the elegant mahogany and brass models of the late 19th century, but instead a simpler design such as one marketed by the London instrument maker Edward Palmer in 1840. Palmer also sold working models of steam engines (Fig. 8), commonly featured in Lardner's lectures. The Drummond light itself was becoming part of the attraction of the lectures, with demonstrations of the power of the light to illuminate the theater, which continued in Lardner's later lectures.


Palmer's Improved Portable Oxy-Hydrogen Apparatus and Microscope with prepared objects, complete.
Fig. 274.
The Microscope is capable of showing various objects, magnified on a medium of from ten thousand to two million times, price £35.; or, without the Microscope, £20. Fig. 274.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At 103, NEWGATE STREET, LONDON.
WORKING MODELS OF STEAM ENGINES AND ALL KINDS OF MACHINERY MADE TO DRAWINGS.
LABORATORIES FITTED UP ON A LARGE OR SMALL SCALE.
LONDON:
PRINTED BY W. GILBERT, SALTERS-HALL COURT, CANNON STREET.
1840.
Entered at Stationers' Hall.

Fig. 8. Edward Palmer's 1840 instrument catalogue, showing his oxy-hydrogen microscope and a working model steam engine.

Lardner, or the writers of the newspaper articles, appear to have used the terms "magic lantern" and "megascope" interchangeably, although the latter has had several other definitions over the last 200 years.[38] It also appears that Lardner had two lanterns, probably a matched pair for dissolving views (hence the reference to "two splendid megascopes"). Two years later, a description of a lecture given in New Haven, Connecticut, referred to ". . . dioramic views and diagrams, produced by that wonder working instrument, the 'Double Megascope,' or 'Compound Philosophical Lantern.'" I also suspect that he was using rear-screen projection, not only because he included phantasmagoria effects in his shows, but also because his "transparencies" often were referred to as "dioramic views."[39] It also is clear that he employed a variety of mechanical special effects slides, including moving astronomical slides and moving slides of comic figures, both readily available from London dealers.

Not surprisingly, Lardner had an assistant, who served as a projectionist and demonstrator. It is not entirely clear who Robert Grant was, or when he became associated with Lardner, because he is not mentioned in any other newspaper accounts of his lecture tour. His very common name makes him hard to identify. However, at about the same time, a Robert Grant proposed to the House of Representatives in Washington a new type of gas lighting for the Capitol, using a process he developed to make illuminating gas from birch tree bark instead of coal.[40] This is consistent with the statement that he had made scientific advances in gas lighting.

Lardner apparently took a special interest in experiments with gas lighting. In late January 1843, following side a side trip to Savannah and Augusta, Georgia, Lardner returned to Charleston and included in a lecture some demonstrations of "modern improvements in artificial illumination." These included "lights produced from gas made from the pitch pine and cotton seed" and culminated with a demonstration of *three Drummond Lights*," most likely those from his two lanterns and the oxy-hydrogen microscope.[41]

Theatrical Interlude

After Lardner completed his tour of Baltimore, Washington, and Alexandria in April 1842, his whereabouts are unknown until the following October. Probably he was following the traditional theatrical season, which typically avoided the hottest months of the year because of the difficulty of ventilating theaters. Before his trip to Charleston, by way of Richmond, Virginia, where he lectured in November, Lardner made a return trip to Philadelphia in October 1842. In addition to his usual fare of lectures on astronomy, steam engines, and physical science, he introduced something new, a series of lectures on the French Revolution. The initial reaction of the *Philadelphia Public Ledger* was not promising:

> Dr. Lardner delivered the first of his series of lectures on the French Revolution, on Monday night, to a very good crowd. We were somewhat disappointed in the lecture; it was not what we had a right to expect from Dr. Lardner, from his former efforts in this city, nor what a man of his talents is able to accomplish, when he puts himself to the task. He was tedious and dull in his narrative, and his style was bald, and his delivery halting and awkward. He must brush up, and show that he comprehends philosophically the great events of the French Revolution. . . .[42]

The writer did concede that the "scenic illustrations, tableaux, &c. are splendid. . . ." Despite the criticisms, the paper dutifully summarized the first lecture in detail, as it did with the other two in the series. The *tableaux* mentioned in the paper were *tableaux vivants*, scenes staged by live actors in the style of a painting. These were produced by Peter Richings (1787-1871) (Fig. 9), a well-known Philadelphia actor and stage manager, and were presented at the beginning and end of each section of the lecture (usually three sections), with as many as six key scenes of the French Revolution illustrated in each of the three lectures.[43]

Fig. 9. Peter Richings and his adopted daughter, Caroline, an actress. New York Public Library.

The *tableaux* were "illuminated by a pale light" (probably dimmed limelight) and "seen through a gauze screen" to simulate the effect of an oil painting on canvas.[44] In his second French Revolution lecture, the audience called for a repetition of a *tableau*, but Lardner apologized for not being able to present it again, because "the material for making the kind of light required had fallen short, and it was with difficulty that they could so economise what they had as to last throughout the representations."[45] Presumably the material in question was either the lime or the gas required for the limelight illumination. Although these *tableaux vivants* were a hit with the audience, Lardner seems not to have used this theatrical form of illustration again.

The Lecture Tour as Scientific Entertainment

Lardner's winter sojourn in Charleston lasted until the end of January 1843. On February 1, he departed for Cuba, where he apparently spent at least a month, although we have no record of his activities there. In mid-March 1843, he arrived in New Orleans. As previously mentioned in the Charleston newspapers, it was becoming increasingly clear that his presentations were as much scientific entertainments as serious lectures. Sometimes he even shared the stage with other forms of entertainment. On March 17, 1843, he lectured at the St. Charles Theatre in New Orleans (Fig. 10) on "the planets, accompanied by scenic illustrations and explanations." The "entertainments" concluded with "the admired petite comedy of the 'Youthful Queen,' in which Mrs. Stuart and J. M. Field appear."[46] On March 31, again at the St. Charles, the evening's entertainment began with a play, "Lying Valet," followed by Lardner's lecture on American and English railways, and concluded with another play, "The Middy Ashore." This was considered by the local paper to be "truly an effective bill, and one which should draw."[47]

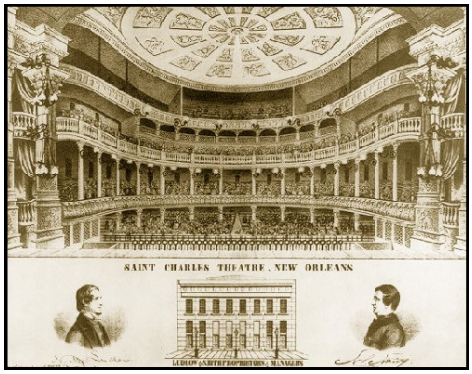

Fig. 10. The St. Charles Theatre in New Orleans, where Lardner lectured in March 1843.

http://old-new-orleans.com/NO_StCharlesTheatre.html

While in New Orleans, Lardner also inserted a current event into his lectures, the appearance of an unusually bright, long-tailed comet that was visibile in March both at night and during the day. This became known as the Great Comet of 1843, visible in both the northern and especially the southern hemisphere (Fig. 11). It attracted a lot of public attention at the time and convinced some Adventist Christians that the Second Coming of Christ and the end of the world were at hand.[48] Lardner assured his audience that there was nothing to fear from this newly discovered comet, which would have no effect on the earth.[49]

Lardner remained in New Orleans until early April and then embarked on the rest of his southern and western tour, visiting cities such as Mobile, Alabama; Jackson and Vicksburg, Mississippi; Cincinnati and Columbus, Ohio; and St. Louis, Missouri. Presumably his lectures were much the same, although in Cincinnati and St. Louis, he introduced a strange new topic, Mesmerism (animal magnetism), including accounts of surgery performed on hypnotized patients and birds mesmerized by a snake.[50] Lardner had long been interested in Mesmerism. In the 1830s, he collaborated with John Elliotson, a chief British proponent of Mesmerism, on experiments to determine the magnetic or electrical forces acting between animals or persons. Also involved in these experiments was Charles Wheatstone, who not only invented the stereoscope, but also was co-inventor of the telegraph, a subject of some of Lardner's American lectures.[51]

Fig. 11. Engraving of the Great Comet of 1843, as seen from Kent, England.

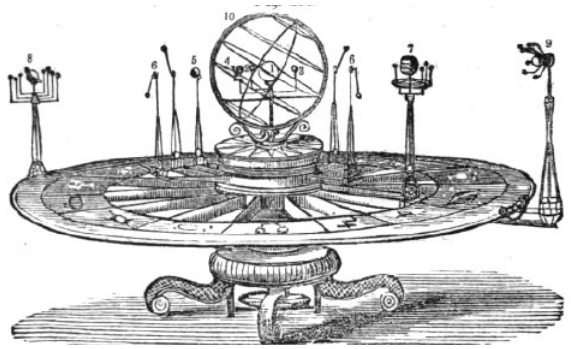

Fig. 12. Russell's Planetarium, a gigantic orrery or working model of the solar system, exhibited by Lardner as part of his astronomy lectures in 1843 and 1844.

From: J. L. Comstock. 1848. *A System of Natural Philosophy* (Pratt, Woodford & Co., New York), p. 310.

By the time Lardner arrived back in New York in late September 1843, he had acquired new material for his shows, "a splendid and novel apparatus, consisting of several hundred telescopic drawings, scenic illustrations, meteorological and other dioramas" [presumably various forms of magic lantern slides].[52] He also had acquired the rights to exhibit a remarkable piece of apparatus that added to the spectacle of his lectures. This was Russell's Planetarium, which was not a planetarium in the modern sense of the word, but an orrery, a mechanical model of the solar system.

Such models were frequently used by scientific lecturers and could be purchased from leading instrument makers in London, usually in a table-top size. Russell's Planetarium was American-made and on an entirely different scale, a room-sized model weighing more than a ton (Fig. 12). The platform alone was some 48 feet in circumference (15.3 feet in diameter) and made of cast iron, with the outermost known planet, Herschel (Uranus) having an orbit of more than 60 feet. More than 500 brass cogwheels set all the planets and their satellites in motion at the turn of a crank. This spectacular device was made by a self-schooled cabinet maker, James Russell, originally from New England, but later living in rural Ohio, near Columbus.

Although almost entirely forgotten today, Russell's Planetarium was hailed at the time as the pinnacle of American ingenuity and was considered superior to any orrery to be found in Europe. Two different versions, one completed in 1836 and an improved, larger model completed in 1842, had been exhibited around Ohio and the Northeast by several different people before Lardner took over. It is not clear whether Lardner owned a share of the planetarium. One account from a Boston paper stated that "The proprietors having experienced the necessity of connecting the apparatus with lectures of a sound and scientific, and at the same time, popular character, and being sensible that Dr. Lardner presented a combination of qualifications which gave him the power of producing it to the American public under peculiar advantages, have recently induced that gentleman to contract with them for the purchase of a large proportion of the interest in the property, and accordingly the apparatus is now, and will be for the future, a part of the means of illustration by which his public lectures will be elucidated."[53] Other accounts said it was the property of two men other than Lardner. The history of the planetarium is given in more detail in a separate article in this issue.

When Lardner presented his first Boston lecture with the planetarium at the Melodeon on October 31, 1843, the crowd was said to be "the most intelligent and brilliant audience ever assembled within the walls of that spacious building—every seat being occupied. . . ."[54] The newspaper went on to claim that Lardner lacked the time to "perfect the light in illuminating the diagrams" and presented the planetarium "as a substitute for the failure of the light." This explanation seems far-fetched considering the fact that the planetarium occupied a good portion of the theater floor in front of the stage, directly in front of the audience. More likely Lardner heightened the drama of his new attraction by omitting his usual illustrations.

The addition of the planetarium to Lardner's lecture repertoire was part of a trend toward increased use of visual effects. As one Boston paper put it, "The illustrations improve every evening, and the illumination is really splendid." The same paper reported that "The magnificent collection of sacred dioramas which are shown every evening at the close of the lecture, excite unqualified admiration." Indeed, as Lardner's collection of lantern slides ("dioramas") continued to increase, he was more inclined to insert Biblical or scenic views unrelated to the main lecture topic, converting scientific lectures into something more like a miscellaneous magic lantern show, which the Boston paper called "these elegant entertainments of Dr. Lardner."[55] Lectures later in his tour included "transparencies of Egyptian statuary,"[56] a "diorama of the departure of the Israelites from Babylon,"[57] scenes along the Rhine,[58] scenic views of Egypt and Rome,[59] and many other views, almost always associated with a lecture on astronomy.

Another innovation was the introduction of music, usually sacred in nature, into Lardner's shows, variously used to accompany exhibitions of lantern views

("dioramas"), his vertical moving panorama of the heavens, or the Russell Planetarium. This transformed his shows from visual spectacles to full-fledged audiovisual entertainments. For example, in Boston's Melodeon on November 7, 1843, an exhibition of "several illuminated dioramas" of astronomy were accompanied by "Handel's Occasional Overtures, and Behold the Lamb of God, from the Messiah . . . performed by Mr. Hayter on the organ." The Hallelujah Chorus and music by Mozart also were performed.[60]

On another evening, an exhibition of the Planetarium was accompanied by Mr. Hayter playing "several grand parts of Haydn's Creation" on the organ. At the end of the program, a "diorama" of the Departure of the Israelites from Babylon was accompanied by Handel's Occasional Overtures.[61] The choice of Haydn's *Creation* is particularly interesting. Since its first public performance in 1799, the musical tone-painting in this oratorio had been compared to a shadow play or a magic lantern show.[62] Lardner's final Boston Melodeon appearance of the year, a Sunday evening "Bridgewater Lecture," had an even more ambitious program, "with a great selection of scenic and telescopic illustrations" and "a variety of Scriptural Dioramas," accompanied by a "Grand Vocal and Instrumental Concert of Sacred Music directed by Mr. Hayter."[63]

When Lardner moved his lectures to Philadelphia in December 1843, he engaged another organist to play in the saloon of Peale's Museum while he exhibited the Planetarium. One newspaper writer thought that the flourishes of the organist "had too much of a theatrical air to be appropriate to the soft and solemn stillness of a starlight scene."[64] Lardner's Philadelphia lectures continued to focus mostly on astronomy, with a variety of visual aids employed, including transparencies, the Planetarium, and his Moving Telescopic Diorama of the Heavens, which he had taken to calling the Uranorama. He continued to use music in many of these lectures, although on one occasion, he had to apologize for the failure of the organist to appear to accompany the Planetarium.[65]

On December 25, 1843, Lardner announced an elaborate "Christmas Evening Entertainment—Concert of Vocal and Instrumental Music." It began with "the Planetarium in motion, accompanied by Haydn's Occasional Overtures, on the Organ, by Mr. Knauff." This was followed by "a Historical and Military Sketch on the subject of Christmas Day, 1776, to be illustrated by a large illuminated plan of the Battles of Trenton and Princeton. . . . after which will be exhibited two Dioramas, copied from National Paintings." These showed Washington crossing the Delaware on Christmas Day, 1776, as well as the surrender of Lord Cornwallis at Yorktown, "accompanied by appropriate music." Next came an "exhibition of a series of Dioramic Pictures with a selection of Vocal Music, arranged and conducted by Mr. Knauff." The views included the Great Aisle and Altar of St. Peter's in Rome; the Bridge of St. Angelo, the Tiber River, and St. Peter's in Rome; Andernach on the Rhine; and Hall in the Palace of Pharaoh. The vocal music for these pictures included "Tyrolese Evening Hymn (Fig. 13)," "Maltese Boatman's Song," "The Last Rose of Summer," and "Araby's Daughter." The musical selections seem not to have had much to do with the projected images.

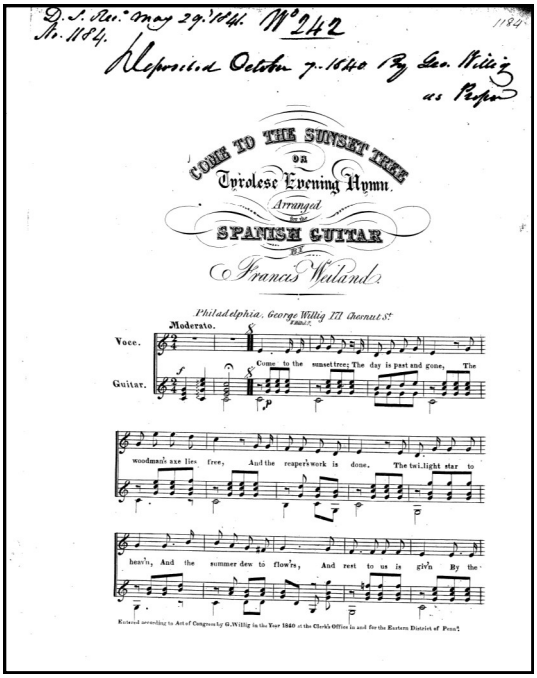
COME TO THE SUNSET TREE
OR
Tyrolese Evening Hymn
Arranged
SPANISH GUITAR
Philadelphia, George Willig Jr. Chestnut St.
Moderato.
Voce.
Guitar.
Come to the sunset tree; The day is past and gone, The
woodman's axe lies free, And the reaper's work is done. The twi.light star to
heav'n, And the summer dew to flow'rs, And rest to us is giv'n By the

Fig. 13. Sheet music for "Come to the Sunset Tree" or "Tyrolese Evening Hymn," one of the musical selections used to accompany magic lantern slides in Lardner's 1843 Christmas night show in Philadelphia.

Library of Congress

This was followed by a demonstration of the Drummond Light illuminating the whole theater. As if this were not enough, the program concluded with "the Uranorama, being a moving Telescopic Panorama of the Firmament," accompanied by vocal music from Haydn's *Creation*. Clearly on this occasion, Lardner abandoned all pretense of a serious scientific lecture in favor of an audiovisual entertainment. A similar program, but with different "dioramic pictures" and different musical selections, was planned for the following evening.[66]

The 1844 Lecture Tour

After spending the Christmas season in Philadelphia, Lardner headed for Washington in January 1844. On January 10, the Washington newspaper announced "Dr. Lardner's Entertainments" at the Assembly Rooms. Apparently he had acquired a new magic lantern: "Since his last trip to Washington, the Doctor has procured from London and Paris an illustrative apparatus of surpassing splendor." The astronomical portion of the entertainment "will be illustrated by a series of magnificent dioramas, amounting to above two hundred in number." "As a sort of afterpiece," there would be "a series of dioramic views of celebrated places . . . such as views of the finest Roman remains, scenes in Palestine, Greece, Egypt, &c.," described as "splendid transparent pictures." Several of these, such as the view of Jerusalem from the Mount of Olives, were "moving panoramas" (probably panoramic lantern slides).[67] A similar program of entertainments was announced in nearby Alexandria, Virginia, a few days later, with illustrations consisting of "several hundred DIORAMAS." Lardner did not bring along the immensely heavy Planetarium on his southern tour.[68]

Lardner continued the reprise of his earlier southern tour by spending several months in Charleston, South Carolina, where the papers announced many of his shows as "Dr. Lardner's Entertainments" or "Scientific Entertainments." The programs were much the same, with ads emphasizing his "pictorial transparencies," one of which was a "Good Night" slide. He also brought along his moving panorama of the heavens, now called the Uranorama, exhibited for the first time in Charleston.[69] In April, it was announced that he had just received from London a new oxy-hydrogen microscope, to be exhibited for the first time in the United States; this appeared in most subsequent lectures.[70]

By June, Lardner had traveled to Baltimore by way of Wilmington, North Carolina. He gave his usual assortment of lectures on astronomy and other topics. *The Baltimore Sun* continued to be one of the few newspapers to explicitly describe his illustrations as being magic lantern views: "Here the lecturer closed on this part of the subject for the evening, and proceeded to exhibit several series of illustrations, on a large scale, by the aid of the magic lantern . . ." He then briefly discussed the history of the magnetic telegraph, reviewing the contributions of Wheatstone (incorrectly called Winston in the article) and American Samuel F. B. Morse. "With these remarks, the lecture closed. It was succeeded by an exhibition of views by the magic lantern on a very extensive scale, representing Rome, St. Peter's, The Coliseum, The Temple of Vesta, The Forum, Trajan's Column, &c., with gorgeous effect." This account not only confirms that Lardner's "dioramas" and "transparencies" were magic lantern slides, but along with many other articles, suggests that he often presented these views after giving each part of his lecture, rather than during the lecture itself. No doubt this was due in part to the difficulty of repeatedly dimming the lights in a theater illuminated by gas lamps, as well as the demands of manipulating the lantern itself.[71]

Another June announcement fully embraced the entertainment value of Lardner's shows, emphasizing optical effects over the substance of his lectures. The program, at the Front Street Theatre, would include a "SPLENDID OPTICAL EXHIBITION and POPULAR LECTURES," comprising four "SCIENTIFIC ENTERTAINMENTS." Included in the optical exhibition were Lardner's entire collection of astronomical views, the gas microscope employed to exhibit "animalcules in water (Fig. 14), mites in cheese," and a large collection prepared items. Twelve Drummond lights would be used to illuminate the theater, and "pictorial dioramas" shown. On occasion, Lardner also would show "Humorous and Comic" views.[72] At one of his Baltimore lectures, Lardner also exhibited the Uranorama.[73]

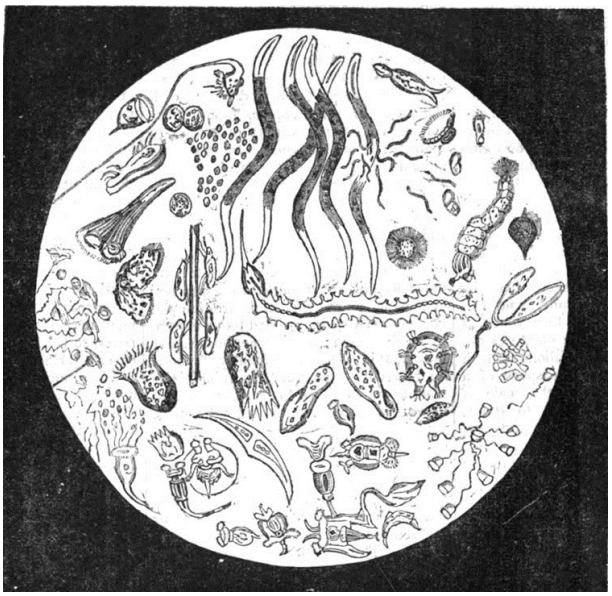

Fig. 14. Drawing of animalcules in a drop of water, as seen projected by the oxy-hydrogen microscope (1833).

By July, Lardner was back in New York, where one of his lectures was on the telegraph. He came in for mild criticism from a newspaper for giving too much credit for the invention to Wheatstone, whom he knew personally, and not enough to American inventor Morse.[74] A side trip to Saratoga apparently was less successful than most of his lectures. He drew a small crowd, while a necromancer and a group of black-face minstrels drew larger audiences to their low-brow entertainments. "Such is the taste and refinement of the dwellers of Saratoga and its visitors."[75] On the other hand, one of his Bridgewater lectures delivered on a Sunday evening in New York was more successful, attended by people "who would otherwise pass [Sunday evening] in listless idleness, or perhaps worse."[76]

In October 1844, Lardner made a return visit to Boston, having once again taken charge of Russell's Planetarium. He announced a series of four entertainments in Tremont Temple, much like the Christmas show in Philadelphia. He assembled his entire array of visual aids for a series of spectacles, exhibiting the planetarium, the moving panorama of the heavens (Uranorama), the oxy-hydrogen microscope, a demonstration of twelve Drummond lights, and "A new and splendid collection of several hundred pictorial illustrations, dissolving views, illustrations of antique gems, medallions &c. &c."

This was followed by a Sunday evening Bridgewater lecture with the Telescopic Panorama of the Firmament" and "numerous scenic illustrations" accompanied by sacred music.[77] Apparently the lectures were a success, although one newspaper writer took a dim view of religious slides shown at the end of the Bridgewater lecture: "After such an exhibition as this, it seems almost like an insult to the audience to present such a wretched series of mere clap-trap dioramas as those which succeeded—'the crucifixion,' 'the host of Pharaoh crossing the sea,' &c, &c, which are miserably designed at best, and poorly portrayed at any rate. This part of the evening's exhibition was entirely superfluous. . . ."[78]

The End of the Road

On October 24, Lardner lectured in Providence, Rhode Island, on his way to another engagement in New York. This proved to be a fateful decision. Sometime during the early morning of October 25, while the theater was empty, a fire of unknown cause broke out and completely destroyed the theater and some adjacent buildings. Also destroyed was Lardner's complete collection of apparatus and visual aids for his lectures:

> The splendid, magnificent Panorama of the Heavens, the most beautiful and impressive thing of the kind which has ever been exhibited to the scientific world, is destroyed and cannot be replaced. We regret the loss of this map of the heavens, more than any thing else. The Planetarium can be more easily replaced, but this is not likely to be done. Mr. Russell is seventy-five years old and will probably never be able to reconstruct it. The Gas Microscope is lost, and a large number of Telescopic Views and Maps of the Moon, the Planets and Stars. The loss to science is irreparable. And the total loss to Dr. Lardner is $25,000.[79]

Newspapers from New Hampshire to New Orleans covered the story of the theater fire, especially in cities where Lardner had lectured. The fire effectively marked the end of Lardner's lecture tour, although he kept previously scheduled engagements in New York and Philadelphia. On November 11, he explained his circumstances to a sparse audience at Palmo's Opera House in New York:

> The profits from these lectures will be applied to aid in constructing an extensive illustrative apparatus to enable Dr. Lardner to continue the work of public instruction throughout the United States, which has been temporarily suspended by reason of the destruction of his former apparatus by fire at Providence.[80]

Unfortunately, without his spectacular illustrations, it was difficult to draw a sufficient audience to actually make a profit from his lectures. In Philadelphia, Lardner advertised a series of lectures on astronomy, offering "a more complete and connected view of that science than has ever before [been] offered in this country." Given that Lardner himself had been lecturing on astronomy for several years, this seems like an exaggerated promise. His announcement stated that "arrangements have been made to prepare ILLUSTRATIONS, inferior in no respect, to those which have been recently lost at the calamitous fire at Providence."[81] When the first lecture, on the Earth, actually took place, Lardner was reduced to using a small globe, probably purchased in a local shop, "not yet having replaced the extensive and beautiful apparata which were destroyed by the calamitous fire at Providence, Rhode Island."[82] Back in New York in December, Lardner made another attempt to revive his lectures, a series of four talks on astronomy to benefit the Apprentice's Library. The announcement made no mention of illustrations.[83]

Lardner eventually gave up his plans to restart his lecture tour. By June 1845, he and Mrs. Heaviside,

along with their children, were back in Paris. Soon after arriving in Europe, the Heavisides were finally divorced and Mary Heaviside married Lardner in Paris. He remained in Europe for the rest of his life, producing an impressive array of books, including a twelve-volume illustrated miscellany called *The Museum of Science and Art*, as well as numerous science and mathematics textbooks for various levels of schools.[84]

Dionysius Lardner was almost certainly the most successful and influential popular science lecturer in America in the 1840s. By his own estimate, he lectured to more than 380,000 people, an impressive number for a country of 20 million, most of whom lived in rural areas. He not only brought popular science, particularly astronomy, to audiences in northeastern cities that were centers of scientific culture, most notably Philadelphia, Boston, and New York, but also to cities where people were seldom exposed to scientific lectures, such as Mobile, Alabama, and Vicksburg, Mississippi.[85] He pioneered the use of multi-media illustrations to enliven science lectures, and his illustrations became more elaborate as his lecture tour progressed, culminating in audiovisual extravaganzas in which music accompanied multiple forms of visual displays.

Finally, with his demonstrations of the magic lantern and the Drummond light, he did much to promote limelight as a new form of illumination, especially for projecting magic lantern slides. The use of limelight made it possible for Lardner to move beyond small town halls and churches visited by itinerant lecturers like Charles Came to larger theaters such as Niblo's Garden in New York and the Melodeon in Boston, a trend that was fully realized nearly two decades later with the coming of stereopticon shows during the 1860s.[86]

Notes and References

1. Robert V. Bruce. 1987. *The Launching of American Science: 1846-1876* (Knopf, New York).

2. Margaret W. Rossiter. 1971. Benjamin Silliman and the Lowell Institute: the popularization of science in nineteenth-century America. *The New England Quarterly* 44:602-626.

3. Leonard G. Wilson. 1998. *Lyell in America: Transatlantic Geology, 1841-1853* (Johns Hopkins University Press, Baltimore).

4. Christoph Irmscher. 2013. *Louis Agassiz, Creator of American Science* (Houghton Mifflin, Boston).

5. Kentwood D. Wells. 2015. The magic lantern in American churches before 1860. *The Magic Lantern Gazette* 27 (4):2-33. Phillip Roberts. 2017. Philip Carpenter and the convergence of science and entertainment in the early-nineteenth century instrument trade. *Science Museum Group Journal*, Spring 2017 (http://dx.doi.org/10.15180/170707).

6. Roger Sherman. 1991. Charles Came, itinerant science lecturer, and his "splendid apparatus." *Rittenhouse: Journal of the American Scientific Instrument Enterprise* 5:118-128. Fred Nadis. 2005. *Wonder Shows: Performing Science, Magic, and Religion in America* (Rutgers University Press, New Brunswick NJ), pp. 29-45.

7. James Delbourgo. 2006. *A Most Amazing Scene of Wonders: Electricity and Enlightenment in Early America* (Harvard University Press, Cambridge MA).

8. Sherman, Charles Came (see note 6). Came's collection of scientific apparatus, including his magic lanterns, eventually ended up at the Smithsonian's Museum of American History.

9. J. N. Hays. 1981. The rise and fall of Dionysius Lardner. *Annals of Science* 38:527-542. Paul H. Theerman. 1997. Dionysius Lardner's American tour: a case study in antebellum American interest in science, technology, and nature, pp. 211-136. In: P. H. Theerman and K. Hunger, eds. *Experiencing Nature* (Kluwer Academic Publishers, Dordrecht, Holland). A. L. Martin. 2015. *Villain of Steam: a Life of Dr. Dionysius Lardner* (Tyndall Scientific, Carlow, Ireland).

10. J. N. Hays. 1983. The London lecturing empire, 1800-50, pp. 91-119. In: Ian Inkster and Jack Morrell, eds. *Metropolis and Province. Science in British Culture 1780-1850* (University of Pennsylvania Press, Philadelphia).

11. http://www.ucl.ac.uk/bloomsbury-project/articles/individuals/lardner_dionysius.htm. Neil Harris. 1973. *Humbug: The Art of P. T. Barnum* (University of Chicago Press, Chicago).

12. Hays 1981; Theerman 1997; Martin 2015 (see note 9).

13. *Gloucester Telegraph*, November 24, 1841, p. 2.

14. *Salem Register*, quoted in *The North American and Daily Advertiser* (Philadelphia), January 7, 1842, p. 2.

15. *The Liberator*, January 21, 1842, p. 11.

16. *The Madisonian*, November 17, 1841, p. 3.

17. Theerman 1997 (see note 9).

18. American newspapers from 1841 to 1845 were searched using the database *America's Historical Newspapers*. Lardner was so well known to the American public that he was almost always referred to as "Dr. Lardner." A search for "Dionysius Lardner" yielded few hits, whereas a search for the combination "Lardner" and "lecture" turned up hundreds of articles and announcements. The blurred line between serious lectures and showmanship among 19th Century popular science lecturers has been the subject of considerable recent research. See, for example: Special issue on Spectacular Astronomy, *Early Popular Visual Culture* 15 (2) (May 2017), especially Kurt Vanhoutte and Nelie Wynants, On the passage of a man of the theatre through a rather brief moment in time: Henri Robin, performing astronomy in nineteenth century Paris, pp. 152-174; Artemis Willis, 'What the moon is like': technology, modernity, and experience in a late-nineteenth-century astronomical entertainment, pp. 175-203. See also: Hsiang–Fu Huang. 2016. When Urania meets Terpsichore: a theatrical turn for astronomy lectures in early nineteenth century Britain. *History of Science* 54:45-70.

19. The confusing array of names for optical entertainments in this era, including the term "dioramas," is dicussed in: Erkki Huhtamo. 2013. *Illusions in Motion. Media Archaeology of the Moving Panorama and Related Spectacles* (MIT Press, Cambridge, MA), pp. 154-159.

20. *Weekly Herald* (New York), November 27, 1841.

21. Article from the *New York Express*, reprinted in the *Alexandria* (VA) *Gazette*, December 15, 1841, p. 1.

22. *Weekly Herald*, December 25, 1841.

23. *Boston Evening Transcript*, January 15, 1842, p. 3.

24. *Daily Atlas* (Boston), January 22, 1842, p. 2.

25. *Boston Courier*, January 31, 1842, p. 3.

26. *Public Ledger* (Philadelphia), March 3, 5, 8, 12, 15, 17, 1842, p.1.

27. *Public Ledger*, March 17, 1842, p. 1.

28. *Public Ledger*, March 23, 1842, p. 1.

29. *Daily National Intelligencer*, April 4, 1842, p. 4.

30. *Daily Madisonian*, March 25, 1842, p. 2; *Daily National Intelligencer*, April 4, 1842, p. 4; *Alexandria Gazette*, April 13, 1842, p. 3; *Baltimore Sun*, April 14, 1842, p. 2.

31. *Baltimore Sun*, April 23, 1842, p. 3.

32. *Charleston Courier*, December 19, 1842, p. 2.

33. *Charleston Courier*, December 21, 1842, p. 2.

34. *Charleston Courier*, December 26, 1842, p. 2.

35. *Charleston Courier*, December 21, 1842, p. 3.

36. "Limelight," in David Robinson, Stephen Herbert, and Richard Crangle, eds. 2001. *Encyclopaedia of the Magic Lantern* (The Magic Lantern Society, London), p. 174.

37. *Lowell Patriot*, August 21, 1835, p. 3.

38. David Brewster. 1831. *Optics (*Longman, Rees, Orme, Brown, and Green, London) (a volume of Lardner's *Cabinet Cyclopedia*): "A modification of the camera obscura, called the megascope, is intended for taking magnified drawings of small objects placed near the lens." The term also has been used to describe a modification of a Fantascope, a type of phantasmagoria lantern, to enable projection of images of solid objects, giving an impression of three-dimensionality (http://precinemahistory.net/1850.htm; http://users.telenet.be/thomasweynants/phantasmagorie.html. See also: "Episcope" and "Fantascope," in *Encyclopaedia of the Magic Lantern* (see note 36).

39. Story from the *New Haven Morning Courier*, reprinted in the *Weekly Ohio Statesman*, July 31, 1844, p 4.

40. Robert Grant—Gas Lights. Report no. 6, 27th Congress, House of Representatives (Google Books).

41. *Charleston Courier*, January 30, 1843, p. 2.

42. *Philadelphia Public Ledger*, October 5, 1842, p. 2.

43. "Richings, Peter." Edited *Appleton's Encyclopedia*, Copyright © 2001 *Virtualology*™

44. *Philadelphia Public Ledger*, October 5, 1842, p. 1. A handbook of home amusements published later in the 19th century provided directions for staging *tableaux vivants*: "There should be a gauze curtain or one of black tarlatan, which should have no seams in it, and this curtain should hang in front of the stage at all times. The drop curtain must be outside of this. The gauze curtain serves as a sort of varnish for the picture, and adds to the illusion." The author added that "pure white light of candles, gas, kerosene, or lime-light is the best for tableaux . . . ." See: M. E. W. Sherwood. 1881. *Home Amusements* (Appleton, New York), p. 21.

45. *Philadelphia Public Ledger*, October 8, 1842, p. 1.

46. *The Daily Picayune*, March 17, 1843, p. 2. Joseph M. Field (1810-1856) was a prominent New Orleans dramatist, actor, theater manager, and journalist, who specialized in comic drama. In his journalism and plays, he mocked current fads such as Millerism (William Miller, an Adventist preacher, predicted the end of the world and the Second Coming of Christ in 1843 based on the appearance of the Great Comet of 1843, a subject of some of Lardner's New Orleans lectures) and Mesmerism (another occasional topic of Lardner's lectures). Field considered Lardner himself to be a charlatan, not a serious scientific lecturer, and lampooned him in a play, *Dr. Heavy Bevy*, performed in the St. Charles Theatre a few days after Lardner lectured there; the title probably was a reference to Lardner's companion, Mrs. Heaviside. The professor in the play lectured on the effects of comets on the earth, a reference to the Great Comet of 1843. See: Charles S. Watson. 2015. *A History of Southern Drama* (University of Kentucky Press, Lexington), p. 59. The handbill for Field's satire even mocked the language of Lardner's advertisements:

> *Dr. Heavy Bevy* will appear and deliver a lecture on Theatrics, illustrated by grand telescopic drawings. Ligitimatics! Pirouettics!! Gagics!!! Nebular and stellar clusters! This part will be illustrated by a large telescopic drawing of the Theatric Heavens, accompanied by a speculation upon cometary influence and probabilities of a collision. Stars! Double stars!! Clusters!!! Colored stars!!!! All taken from original drawing by eminent observers.

See: Noah Miller Ludlow. 1880. *Dramatic Life as I Found It* (G. I. Jones & Company, St. Louis), p. 570.

47. *The Daily Picayune*, March 31, 1843, p. 2.

48. Stella Cottam and Wayne Orchiston. 2015. *Eclipses, Transits, and Comets of the Nineteenth Century. How America's Perception of the Skies Changed* (Springer, New York), pp. 17-25. See also Kentwood D. Wells. 2007. A comet on a toy magic lantern slide. *The Magic Lantern Gazette* 19 (2):12-13 (Summer 2007).

49. Story from the *New Orleans Bulletin*, reprinted in the *Arkansas Weekly Gazette*, April 5, 1843, p. 3. Same story reprinted in *Charleston Courier*, April 7, 1843, p. 2.

50. *The Daily Picayune*, April 16, 1843, p.2; *Ohio State Journal* (Columbus), July 5, 1843, p. 2; *Philadelphia Public Ledger*, July 11,, 1843, p. 2 (about lectures in St. Louis); *Alexandria Gazette*, July 27, 1843, p. 2 (about lecture in Cincinnati); *The Daily Picayune*, August 8, 1843, p. 2 (about lecture in Cincinnati); *Alexandria Gazette*, August 31, 1843, p. 3 (about lecture in Cincinnati); *Southern Patriot* (Charleston), September 13, 1843, p. 2 (about lecture in St. Louis).

51. Alison Winter. 2000. *Mesmerized: Powers of Mind in Victorian Britain* (University of Chicago Press, Chicago), especially pp. 53 -54.

52. *Boston Evening Transcript*, September 21, 1843, p. 4 (story from *New York Herald*).

53. One of many descriptions of Russell's Planetarium, taken from the *Boston Post*, appeared in the *New Hampshire Sentinel* (Keene NH), November 8, 1843, p. 2.

54. *Boston Evening Transcript*, November 1, 1843, p. 2.

55. *Boston Evening Transcript*, November 4, 1843, p. 2.

56. *Boston Courier*, November 9, 1843, p. 1.

57. *Boston Courier*, November 9, 1843, p. 4.

58. *Philadelphia Public Ledger*, December 13, 1843, p. 1.

59. *Philadelphia Public Ledger*, December 25, 1843, p. 2.

60. *Boston Courier*, November 9, 1843, p. 2. Aaron U. Hayter (1799-1873), the organist for Trinity Episcopal Church in Boston, was Director of the Handel and Haydn Society and greatly influenced the performance of the works of these composers in the United States. See: "The Late A. U. Hayter," *Folio*, vol. 9, no. 4 (October 1873), p. 101; Charles C. Perkins and John S. Dwight. 1883-1893. *History of the Handel and Haydn Society of Boston, Massachusetts* (Alfred Mudge and Son, Boston). In 1843, the Handel and Haydn Society was the proprietor of Boston's Melodeon, where Lardner lectured.

61. *Boston Courier*, November 9, 1843, p. 4.

62. Deirdre Loughridge. 2016. *Haydn's Sunrise, Beethoven's Shadow. Audiovisual Culture and the Emergence of Musical Romanticism* (University of Chicago Press, Chicago), pp, 163-199. See also: Deirdre Loughridge. 2016. Celestial mechanisms: Adam Walker's Eidouranion, Celestina, and the advancement of knowledge, pp. 47-76. In: James Q. Davies and Ellen Lockhart, eds. *Sound Knowledge. Music and Science in London, 1789-1851* (University of Chicago Press, Chicago).

63. *The Daily Atlas* (Boston), November 18, 1843, p. 3. Lardner's "Bridgewater Lectures" were a regular Sunday evening feature of his lecture tour. Many people objected to secular performances on Sundays, so Lardner gave his usual astronomy lectures with an overlay of Natural Theology, using the universe as an example of the wisdom and benevolence of the Creator. The name comes from the *Bridgewater Treatises*, a series of books published in Britain in the 1830s that used sciences such as astronomy, geology, anatomy, and natural history as demonstrations of the "power, wisdom, and goodness of God, as manifested in the Creation." See: Jonathan Topham. 1992. Science and popular education in the 1830s: the role of the *Bridgewater Treatises*. *British Journal for the History of Science* 25:397-430.

64. *Philadelphia Public Ledger*, December 14, 1843, p. 1.

65. *Philadelphia Public Ledger*, December 16, 1843, p. 1.

66. *Philadelphia Public Ledger*, December 25, 1843, p. 2. Henry Knauff was a prominent professional musician and manufacturer of pipe organs in Philadelphia. See: *Philadelphia and Popular Philadelphians* (*The North American*, Philadelphia, 1891), p. 135.

67. *Daily National Intelligencer*, January 10, 1844, p. 3.

68. *Alexandria Gazette*, January 15, 1844, p. 3.

69. *The Southern Patriot*, Feburary 13, 26, 27, 29; March 2, 1844.

70. *Charleston Courier*, April 23, May 1, 1844; *Southern Patriot*, April 30, May4, 1844.

71. *Baltimore Sun*, June 13, 1844, p. 1.

72. *Baltimore Sun*, June 17, 184, p. 2.

73. *Baltimore Sun*, June 20, 1844, p. 1.

74. Story about New York lecture in *Philadelphia Public Ledger*, July 22, 1844, p. 2.

75. *Philadelphia Public Ledger*, August 3, 1844, p. 2.

76. *The Weekly Herald* (New York), August 31, 1844.

77. *Boston Evening Transcript*, October 1, 1844, p. 3.

78. *Boston Evening Transcript*, October 7, 1844, p. 2.

79. Story from Providence newspaper, reprinted in *Baltimore Sun*, October 29, 1844.

80. *New York Herald*, November 12, 1844, p. 2.

81. *Philadelphia Public Ledger*, November 16, 1844, p. 3.

82. *Philadelphia Public Ledger*, November 20, 1844, p. 1.

83. *New York Herald*, December 10, 1844, p. 4. The Apprentice's Library, founded in 1820 by the General Society of Mechanics and Tradesmen of the City of New York, was one of the first public libraries in the city.(https://en.wikipedia.org/wiki/General_Society_of_Mechanics_and_Tradesmen_of_the_City_of_New_York#Library).

84. Martin, *Villain of Steam* (see note 9). Many of Lardner's works are available in digital form through Google Books, Internet Archive, and other sources.

85. For Lardner's audience estimate, see *New York Herald*, November 12, 1844, p. 2. For the cultural significance of Lardner' lectures, see: Theerman, Dionysius Lardner's American tour (see note 9). Theerman estimated Lardner's total audience at about 150,000, about 5% of the urban population of the United States, which was less than 3 million.

86. Kentwood D. Wells. 2008. What's in a name? The magic lantern and the stereopticon in American periodicals 1860-1900. *The Magic Lantern Gazette* 20 (3):3-19; Kentwood D. Wells. 2011. The stereopticon men: on the road with John Fallon's stereopticon, 1860-1870. *The Magic Lantern Gazette* 23 (3):3-35.

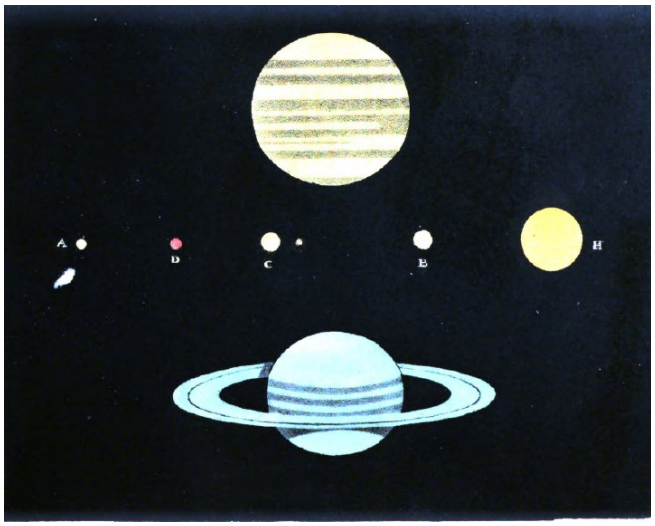

Fig. 15. The relative size of the planets.

From: Blunt (1849) *The Beauty of the Heavens*.

Russell's Planetarium: "One of the Greatest Curiosities of the Day"

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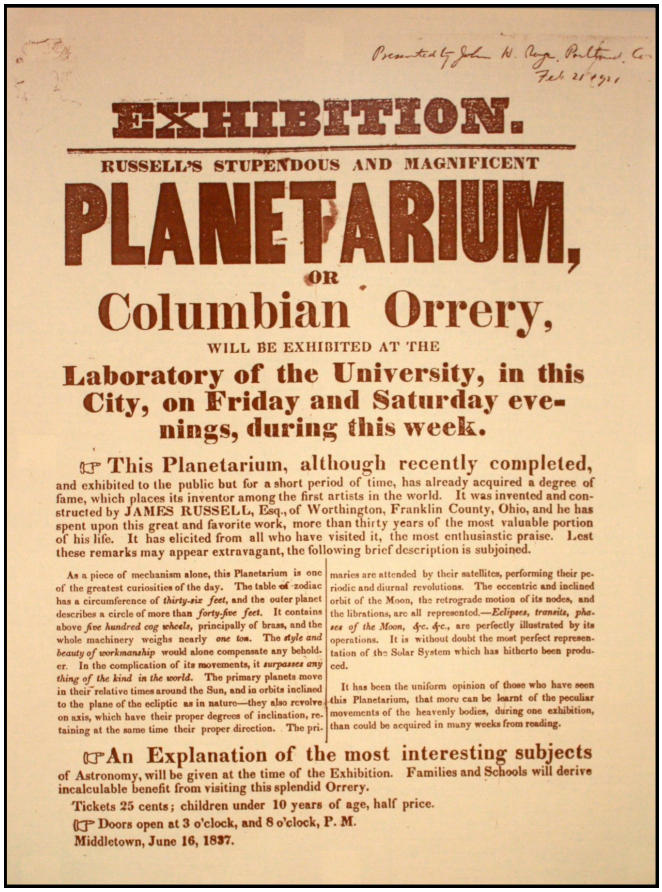

EXHIBITION.

RUSSELL'S STUPENDOUS AND MAGNIFICENT

PLANETARIUM,

OR

Columbian Orrery,

WILL BE EXHIBITED AT THE

Laboratory of the University, in this City, on Friday and Saturday evenings, during this week.

☞ This Planetarium, although recently completed, and exhibited to the public but for a short period of time, has already acquired a degree of fame, which places its inventor among the first artists in the world. It was invented and constructed by JAMES RUSSELL, Esq., of Worthington, Franklin County, Ohio, and he has spent upon this great and favorite work, more than thirty years of the most valuable portion of his life. It has elicited from all who have visited it, the most enthusiastic praise. Lest these remarks may appear extravagant, the following brief description is subjoined.

As a piece of mechanism alone, this Planetarium is one of the greatest curiosities of the day. The table of zodiac has a circumference of *thirty-six feet*, and the outer planet describes a circle of more than *forty-five feet*. It contains above *five hundred cog wheels*, principally of brass, and the whole machinery weighs nearly *one ton*. The *style and beauty of workmanship* would alone compensate any beholder. In the complication of its movements, it *surpasses any thing of the kind in the world*. The primary planets move in their relative times around the Sun, and in orbits inclined to the plane of the ecliptic as in nature—they also revolve on axis, which have their proper degrees of inclination, retaining at the same time their proper direction. The primaries are attended by their satellites, performing their periodic and diurnal revolutions. The eccentric and inclined orbit of the Moon, the retrograde motion of its nodes, and the librations, are all represented.—*Eclipses, transits, phases of the Moon, &c., &c.*, are perfectly illustrated by its operations. It is without doubt the most perfect representation of the Solar System which has hitherto been produced.

It has been the uniform opinion of those who have seen this Planetarium, that more can be learnt of the peculiar movements of the heavenly bodies, during one exhibition, than could be acquired in many weeks from reading.

☞An Explanation of the most interesting subjects of Astronomy, will be given at the time of the Exhibition. Families and Schools will derive incalculable benefit from visiting this splendid Orrery.

Tickets 25 cents; children under 10 years of age, half price.

☞ Doors open at 3 o'clock, and 8 o'clock, P. M.

Middletown, June 16, 1837.

Fig. 1. Handbill advertising an exhibition of Russell's Planetarium at Wesleyan University in June 1837.

Paul Erickson & Wesleyan University.

In June 1837, handbills announced an exhibition at Wesleyan University in Middletown, Connecticut, of "one of the greatest curiosities of the day" (Fig. 1). This was "Russell's Stupendous and Magnificent Planetarium or Columbian Orrery," a gigantic working model of the solar system. This impressive instrument was made by a self-taught cabinet maker living in rural Worthington, Ohio, James Russell, assisted by several friends, including Ralph Hills, George Topping, and Potter Wright, who provided the facilities of his machine shop.[1] These handbills actually referred to the first of two models constructed by Mr. Russell. Completed in 1836, it was exhibited to the public in Columbus, Ohio and other cities, including Washington, D.C., in 1836 and 1837. In Columbus, it was displayed in the Council Chamber of the Capitol. Russell's friend Ralph Hills was on hand to explain the workings of the planetarium and the principles of astronomy it illustrated.[2] Dr. Hills accompanied the planetarium to Washington, where it was exhibited in the Mason's Hall in the winter and spring of 1837.[3]

A local Washington newspaper provided a detailed description of the planetarium, which was copied by papers in other cities. An abbreviated version is given here, without all the details of planetary motion:

> Its *form* is also *original*, and one of great beauty. It is that of a large circular table, the table part having a circumference of thirty-six feet [11.5 feet in diameter], and being about three and a half feet from the floor (see Fig. 12 in previous article). This table itself is a most beautiful piece of work. A portion of it is intended to represent the zodiac, and has twelve signs upon it, and also the months of the year, the days of the month, and the degrees of celestial longitude. Upon other portions of the table are represented beautiful telescopic appearances of the moon and planets, and diagrams used in illustrating the science.
>
> Above the table are placed the globes representing the sun, earth, moon, and planetary bodies, both primary and secondary. The sun is represented in the center by a gilt globe about fourteen inches in diameter, which revolves about its axis in about its proper time with the other movements given. The primary planets are represented by beautiful glass globes, made opaque, with some attention to their relative magnitudes and telescopic appearances, and are placed in their regular order from the center of the system. . . .
>
> The eighteen secondary planets or satellites, including the moon, are all represented by ivory globes, and the rings of Saturn are represented by rings of brass. . . . [The] planet [Herschel = Uranus] and its system of satellites move in an orbit beyond the table, so that its orbit has a circumfer-

> ence of more than forty-five feet [14 feet in diameter]. . . .
>
> All the revolutions and movements here described are received from the turning of a crank, and are all proceeding at one and the same time. The wheel work and machinery through which they take place is displayed as much as possible to add to the interest of visitors. The remarkable ease with which the whole machinery is moved is almost incredible, for although it contains above 500 metallic cog wheels, and weighs nearly one ton, yet a child of two years can turn it with ease. For use in the evening the sun is represented by a luminous globe, illuminating the earth, moon, and planetary bodies, as in nature.[4]

There is not much newspaper record of the exhibitions of Russell's first model, perhaps because exhibitions were announced mainly by handbills and broadsides. In June 1837, this model ended up at Wesleyan University, where it was exhibited and subsequently purchased by the university president as a teaching tool. The Wesleyan catalogue for 1837-1838 stated that "The Philosophical and Astronomical Apparatus has been recently increased by an expenditure of about $6000,—and an addition of about 100 instruments." Among these was "Russell's Magnificent Orrery, a new and unrivalled instrument, and the only one of the kind in the world."[5] More than two decades later, the Wesleyan catalogue for 1859-1860 listed Russell's Planetarium as a piece of apparatus available for teaching astronomy.[6] In 2015, when the university was preparing an exhibit on the history of the its astronomical observatory, parts of the planetarium were discovered in the observatory library, specifically a wooden box labelled "Planets" that contained the blown-glass globes originally used to represent the planets in their orbits around the sun, as well as the ivory moons (Fig. 2).[7]

Fig. 2. Box with glass globes representing the planets in the first model of Russell's Planetarium, as well as ivory balls representing planetary moons. Paul Erickson & Wesleyan University

After the first planetarium was sold to Wesleyan, Russell set about building a new and improved model, which was completed in 1842 and was the one exhibited by Dionysius Lardner and others in the early 1840s. The basic design of the two models was similar, but the second one was considerably larger than the first. The table had increased to 48 feet in circumference (15.3 feet in diameter) and the orbit of Herschel to more than 60 feet. The sun, planets, and moons were similar to the first model, although the sun apparently increased in diameter from 14 to 15 inches.[8]

The new model planetarium was exhibited in a number of cities, mostly in Ohio and the Northeast, often with different lecturers providing commentary. In early July 1842, the planetarium was in the State House in Columbus, Ohio, with a Prof. Bosworth, presumably a local man, as lecturer. The planetarium seems to have been the sole form of illustration, although a telescope viewing was offered in the evening.[9] Later in July, the planetarium was exhibited in Newark, Ohio, about 30 miles from Columbus.[10] It then moved to the Court House in Cleveland, where Prof. Bosworth again used it to illustrate a series of lectures on astronomy, with an additional lecture by Mr. H. Smith.[11]

By early September, the planetarium was in Buffalo, New York, perhaps having traveled from Cleveland by steamboat on Lake Erie.[12] It also was shown in Utica, New York sometime between September and December 1842, and may have stopped in other cities along the Erie Canal.[13]

It is not clear who actually owned the planetarium at this point, but Russell himself seems to have realized little financial reward from his invention. After a series of four lectures at the State House in Columbus, an additional lecture was held as a benefit for Mr. Russell, but he probably made little money from it.[14] A Cleveland newspaper described Mr. Russell as "aged, poor, and feeble, dependent on his daily labor for a morsel of bread."[15] Throughout the planetarium's tour, prominent Ohioans periodically issued pleas in newspapers for citizens and institutions to provide financial support for Russell, apparently without much success.[16]

After the long journey through Ohio and upstate New York, the unknown proprietors of the planetarium brought it to New York, where Francis Fauvel Gouraud (1808-1847) took over lecturing duties (Fig. 3). Gouraud is known as the person who introduced the daguerreotype photographic process to America, as well as the first photographic camera. He also invented a system of memorizing numbers (Mnemonic

Fig. 3. Francis Fauvel Gourad, a French immigrant who lectured with Russell's Planetarium in the 1840s. Wikimedia

major system).[17] How he came to be associated with the planetarium is unknown. He gave a series of lectures at the American Institute from January through March 1843 in which the planetarium was the main feature. The *New York Express* reacted enthusiastically, calling the device "a wonderful mechanical Panorama."[18]

In September 1843, Dionysius Lardner announced his intention to exhibit the planetarium in New York, which prompted Gouraud to seek an injunction to prevent him from doing so.[19] This dispute apparently was resolved in favor of Lardner, who turned up with the planetarium in Boston in October 1843.[20] Gouraud later tried to raise money to pay Mr. Russell to build another model of the planetarium, "which will far excel the one that excited so much admiration in New York, and caused considerable contention among those desiring possession."[21] This plan never came to fruition. Lardner continued to incorporate the planetarium into his lectures in northeastern cities through the fall of 1843 until departing on his second southern tour in January 1844, as described in the previous article.

Sometime during the summer of 1844, the planetarium was purchased from the original proprietors by "two gentlemen."[22] Evidently, these were G. R. Haswell and a man named Robinson, the two men named as owners when the planetarium was destroyed in the Providence theater fire the following October. Exactly who these men were is not clear, although most likely they were New Englanders.[23] The planetarium was exhibited by G. R. Haswell at City Hall in Hartford, Connecticut in July 1844. The Hartford paper included an engraving of the planetarium (the same as Fig. 12 in previous article), as well as a detailed description of the device, but said nothing about the accompanying lecture.[24]

By the end of July, the planetarium was in New Haven, where the lectures included the full range of magic lantern slides, "dioramas," etc., displayed with the "Double Megascope or Compound Philosophical Lantern."[25] This suggests that Lardner probably gave the lectures in both Hartford and New Haven, since no other exhibitors of the planetarium are known to have used these visual aids.

The planetarium also was exhibited by "two gentlemen," presumably Haswell and Robinson, at Brinley Hall in Worcester, Massachusetts.[26] Beginning on September 24, 1844, Haswell and Robinson exhibited the planetarium in Marlboro Chapel in Boston and engaged "Mr. Thomas Hill, of Harvard University," to give the accompanying lecture on astronomy. At the time, Thomas Hill (1818-1891) was a newly minted Harvard graduate with an interest in scientific instruments; nearly twenty years later, he became President of Harvard University (1862-1868) (Fig. 4).[27]

Apparently Hill had access to Lardner's equipment, since the lecture announcement included his full range of visual aids, including "200 *Transparent Dioramas*, many of them moveable." After the engagement at Marlboro Chapel concluded on September 27, Dr. Lardner himself reappeared and opened a new exhibition at Tremont Temple on October 2, again with the full range of magic lantern slides, gas microscope, and Uranorama.[28] He continued to exhibit the planetarium until its demise in the Providence fire later in October.

Poor Mr. Russell, who never seems to have made any money from his glorious invention, never completed another model of the planetarium. Along with supportive citizens of Columbus, Ohio, he petitioned Congress to appropriate funds for the Smithsonian Institution to buy a new planetarium, but nothing came of the effort.[29] In 1845, Russell was nominated by the Democratic party to stand for election as Mayor of Columbus. He lost the race to the Whig candidate, Alexander Patton, a carpenter who had lived in Columbus since the city's founding in 1813 and helped to construct many of its first buildings.[30]

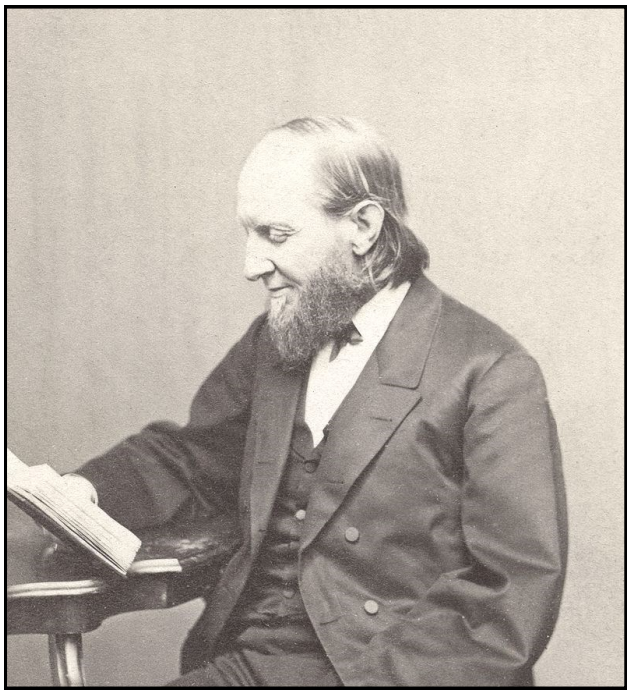

Fig. 4. Thomas Hill as President of Harvard c. 1865. As a young man, he lectured with Russell's Planetarium and magic lantern slides. Wikimedia

Notes and References

1. "Russell's project evolved over several years with the assistance of several interested young men, such as Ralph Hills and George Topping, and the facilities of Potter Wright's machine shop;" Virginia E. McCormick and Robert W. McCormick. 1998. *New Englanders on the Ohio Frontier: Migration and Settlement of Worthington, Ohio* (Kent State University Press, Kent, Ohio), p. 229. Ralph Hills (1810-1879) was a physician who was born in Worthington and practiced in nearby Delaware, Ohio. In 1856, he was appointed Superintendent of the Ohio Lunatic Asylum in Columbus, and later was Superintendent of the West Virginia Lunatic Asylum. His obituary stated that "He was ingenious in invention, possessed of great mechanical skill;" Ralph Hills, M. D., *Transactions of the XXXVth Annual Meeting of the Ohio State Medical Society, Held at Cleveland, June 15th, 16th and 17th, 1880*, pp. 118-119. According to the *History of Delaware County and Ohio* (O. L. Baskin & Co., Chicago, 1880), p. 234, Hills "was employed to deliver lectures on astronomy, and to travel with Russell's Great Planetarium for a year or two (about 1836-37)," but his itinerary was not specified. George Topping was a member of one of Worthington's founding families, but there is no information on his profession. See: McCormick & McCormick, *New Englanders on the Ohio Frontier*. James Russell's daughter, Mary Ann Russell, was married to a member of the Topping family, perhaps George Topping's son. See: http://www.worthingtonhistory.org/Resources_Links/Around_Worthington/National_Registry/national_registry.html. Like Russell himself, Potter Wright was originally a New Englander. He moved to Worthington as part of the westward migration at the end of the War of 1812 and set up a carding and machinery factory. See: McCormick & McCormick, *New Englanders on the Ohio Frontier*, p. 168.

2. *Ohio State Journal and Columbus Gazette*, December 30, 1836, p. 3

3. *Daily National Intelligencer*, February 22, 1837, p. 1.

4. Description of Russell's Planetarium from the *Washington Reformer*, published in the *National Gazette and Literary Register* (Philadelphia), April 27, 1837, p. 2.

5. 1837-1838 Wesleyan catalogue, quoted in: *The Wesleyan University Bulletin* 18 (5) (December 1924), p. 30.

6. *Catalogue of the Wesleyan University 1859-60*, p. 31.

7. "Wesleyan's observatory to celebrate 100th anniversary," Hartford Courant, August 9, 2015 (http://www.courant.com/news/connecticut/hc-wesleyan-centennial-celebration-20150809-story.html)

8. *Supplement to the Connecticut Courant*, May 14, 1842.

9. *Ohio Statesman* (Columbus), June 29, 1842, p. 3.

10. Story from *Newark Constitutionalist*, published in *Ohio Statesman*, July 27, 1842, p. 2.

11. *Annals of Cleveland 1818-1935. A Digest and Index of the Newspaper Record of Events and Opinions*. 1842. Vol. XXV, p. 16 (Works Progress Administration, Cleveland, Ohio, 1938).

12. Mention of exhibition in Buffalo, *Connecticut Courant*, September 3, 1842, p. 3.

13. Mention of exhibition in Utica, *Ohio Statesman*, December 29, 1842, p. 3.

14. *Daily Ohio State Journal*, July 8, 1842, p. 2.

15. *Annals of Cleveland* (see note 11), p. 17.

16. *Ohio Statesman*, January 11, 1843, p. 3; March 10, 1843, p. 3; March 22, 1843, p. 1.

17. Francis Fauvel Gouraud, *Wikipedia*. Francis Fauvel-Gouraud. 1845. *Phreno-Mnemotechny; or, the Art of Memory* (Wiley & Putnam, New York). This book contains appendices with newspaper articles that mention the planetarium.

18. Story from the *New York Express*, published in *Ohio Statesman*, January 11, 1843, p. 3.

19. *Boston Evening Transcript*, September 30, 1843, p. 2.

20. *Boston Evening Transcript*, October 25, 1843, p. 2.

21. *Boston Evening Transcript*, July 6, 1844, p. 2.

22. *Boston Evening Transcript*, August 29, 1844, p. 2.

23. Mr. Robinson may have been Hartford book and map publisher David F. Robinson, who published, among many other titles, J. L. Comstock's *Natural History of Birds* (1830) and his *Elements of Chemistry* (1831). Comstock was a fellow resident of Hartford who produced an engraving of Russell's Planetarium that appeared in the Hartford newspaper (see note 24). See: https://archive.org/search.php?query=publisher%3A%22Hartford+%3A+D.F.+Robinson+%26+co.%22. See also: J. Hammond Trumbull, ed. 1886. *Memorial History of Hartford County, Connecticut 1633-1884* (Edward L. Osgood, Boston), vol. 1, p. 623. The most likely candidate for Haswell is Rev. George R. Haswell, possibly originally from New England and later associated with churches in New York and Toledo, Ohio. In 1836, George R. Haswell represented Providence, Rhode Island at the annual meeting of the American Anti-Slavery Society in New York. See: *Third Annual Report of the American Anti-Slavery Society* (William S. Dorr, New York, 1836), p.21. In 1840, Rev. George R. Haswell was part of a group of

Presbyterians in New York who voted to form a Congregational Church, on the New England model. See: *History of Broadway Tabernacle Church* (S. W. Benedict, New York, 1846), p. 6; Jonathan Greenleaf. 1846. *A History of the Churches of all Denominations in the City of New York* (E. French, New York), p. 361. In 1841, a Presbyterian church in Toledo, Ohio pastored by George R. Haswell adopted a Congregationalist form of government, eventually forming the First Congregational Church of Toledo. See: Harold J. Sherman. 1956. The beginnings of the Presbyterian Church in Toledo. *Northwest Ohio Quarterly* 21:122. In the same year, Rev. G. R. Haswell of Ohio gave a series of lectures on astronomy in Milwaukee, Wisconsin. See: Donald Zochert. 1974. Science and the common man in Ante-bellum America. *Isis* 65:448-473.

24. *Supplement to the Connecticut Courant*, July 20, 1844. The engraving of the planetarium was supplied to the Hartford paper by J. L. Comstock, the author of the textbook in which the engraving appeared, and a resident of Hartford.

25. Story from the *New Haven Morning Courier*, published in the *Ohio Statesman*, July 31, 1844, p. 4.

26. *Massachusetts Spy* (Worcester), September 3, 1844, p. 3. The site of the first and second National Woman's Rights Conventions in 1850 and 1851, "Brinley Block" was erected in 1836-37 by Benjamin Butman and George Brinley. A bank, shops, and law offices took up space on the first and second floors of the building. The three-story structure included a large hall on the third floor. Until the opening of Mechanics Hall in 1857, Brinley Hall was the favorite place for large gatherings and celebrations of religious, anti-slavery, temperance, and moral reform societies. http://www.worcesterhistory.org/photo-BrinleyHall.html

27. *Boston Courier*, September 23, 1844, p. 3; September 26, 1844, p. 2; *Boston Evening Transcript*, September 23,, 1844, p. 3. Thomas Hill (clergyman), *Wikipedia*.

28. *Boston Evening Transcript*, September 30, 1844, p. 3; October 1, 1844, p. 3.

29. *Ohio Statesman*, November 27, 1844, p. 2.

30. *Tri-Weekly Ohio Statesman*, April 4, 1845, p. 2. Alexander Patton, *Wikipedia*. See also: https://www.findagrave.com/cgi-bin/fg.cgi?page=gr&GRid=14510727

Book Review

L. M. H. Smith. 2017. *Show People Sculpted. A Catalogue of 18th and 19th Century Figurines Depicting Magic Lantern and Peepshow Performers*. Privately published. Hardcover, 84 pages.

How curious and wonderful that the itinerant showman who lugged magic lanterns and peepshows around the countryside and among the city streets, competing for attention with street vendors and entertainers, were memorialized in porcelain, earthenware, bronze, ivory, and wooden figurines during the 18th and 19th centuries. Mike Smith has recently published *Show People Sculpted*, not only showcasing his own extensive collection but also those of other collectors to present a broad array of marvelous figurines. Page after page is filled with luscious pictures of these delightful figurines and details about them. Smith's book is made more interesting by a thoughtful introduction by David Robinson in which he traces the history of the production of porcelain figurines and how these showmen were captured by sculptors of the time.

In the seventeenth century engravers began publishing portfolios of prints featuring realistic depictions of the vendors and entertainers who plied major European city streets. Both Marcellus Laroon's *Cryes of the City of London* (1687) and Edmé Bouchardon's *Les Cris de Paris* (1736 -1748) focus on the people rather than the surrounding environment. One of the rarer pieces in *Show People Sculpted* is a figurine based on Bouchardon's drawing (Fig. 1) depicting a young woman generously swaddled in a loose draping robe holding a hurdy-gurdy, tucked against her stomach, with her magic lantern and slides strapped to her back. Similarly we discover a polychromed wooden figure (Fig. 2) depicting a gaunt, stooped, shoeless showman, his coat frayed at the edges and his peepshow strapped to his back. The stark realism of these two figurines, as David Robinson points out, was soon replaced by a more romanticized approach to the various showmen in the softer edged rococo style that was suited to the taste of consumers of the time. A good example is a colorful 19th century peepshow grouping (Fig. 3) based on a model first produced by the French firm, Sévres in 1757. Here we see no tattered clothes but instead a well-dressed, handsome youth showing a mother and her child his peepbox views.

These figurines in their various forms proved quite popular and were produced across France, Germany, England and Austria. We are fortunate that these beautiful pieces have found their way into this book and remind us of the popularity of both the magic lantern and the peepshow. This is a book well worth adding to your collection. Anyone interested in purchasing the book can write directly to Mike Smith at lmh.smith@magiclanternsocy.demon.co.uk.

Richard Balzer

Fig. 1

Fig. 2

Fig. 3

Representative magic lantern and peepshow show people sculptures.

Above: A lunar eclipse, from Charles F. Blunt, *The Beauty of the Heavens* (1849) (first published 1840).

Front Cover: Full moon, from the same volume.

These and other prints are used to represent the style of illustrations that would have appeared in the lectures of Dionysius Lardner in the 1840s. Charles F. Blunt was an optical instrument maker in London who advertised a set of astronomical magic lantern slides that may have had similar images. See: Deirdre Loughridge. 2016. Celestial mechanisms: Adam Walker's Eidouranion, Celestina, and the advancement of knowledge, pp. 47-76. In: James Q. Davies and Ellen Lockhart, eds. *Sound Knowledge. Music and Science in London, 1789-1851* (University of Chicago Press, Chicago), p. 69.